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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/057,502	04/09/1998	EIICHI SANO	009683-329	6476
21839	7590	06/21/2004	EXAMINER	
BURNS DOANE SWECKER & MATHIS L L P			NGUYEN, LAM S	
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DATE MAILED: 06/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center">Office Action Summary</p>	Application No. 09/057,502	Applicant(s) SANO ET AL.	
	Examiner LAM S NGUYEN	Art Unit 2853	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-11,13-18 and 20-33 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-11,13-18 and 20-33 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 1998 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

During the interview on 04/14/2004, the examiner agreed that Koitabashi et al. reference does not anticipate the claimed invention so the 102 rejection in the final office action is improper. Therefore, the finality (mailed on 01/06/2004) is withdrawn and the Advisory Action (mailed on 05/06/2004) is vacated. The new ground of rejection is made as follows:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-3, 5, 7-11, 13, 15-18, 20, 22-27, 29-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koitabashi et al. (US 6325492) in view of Nagoshi et al. (US 6106093).

Koitabashi et al. disclose an ink jet printer ejecting a plurality of kinds of ink droplets, including smoothing droplets and image forming droplets, of different sizes depending upon data to be printed (column 27, line 5-17: ink ejection in the vary amount mode is performed through the same ejection opening and the ejection amount can be varied during successive ejection), thereby forming an image on a prescribed recording medium using dots of sizes corresponding to the sizes of the ink droplets (FIG. 43), comprising:

a smoother for performing a smoothing process using a dot (FIG. 43: the shaded dots) smaller than a dot forming said image (FIG. 43: the blank dots); and

a controller for controlling said smoother to print a center of said smaller size dot

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close to a center of said image forming dots at a distance smaller than the pitch of the image forming dots, or for changing a distance between the centers of adjacent dots thereby to change the printing position of at least the smoothing dots based on the size of the dot in printing said plurality of kinds of dots (FIG. 43, column 25, line 45 to column 26, line 17).

Koitabashi et al. do not disclose wherein said smaller dot and said image forming dot are ejected from a single nozzle.

Nagoshi et al. disclose an ink jet recording apparatus capable of recording in different resolutions having a mode in that a smoothing treatment is executed for the formation of images with droplets having different sizes ejected from the same single nozzle to achieve the formation of higher quality images without creating any image defects (column 5, lines 40-60 and column 7, lines 30-41).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printing process in the printing apparatus disclosed by Koitabashi et al. such that ejecting the smaller dots and the image forming dots from the same single nozzle in the smoothing process as disclosed by Nagoshi et al. The motivation of doing so is to achieve the formation of higher quality images without creating any image defects as taught by Nagoshi et al. (column 5, lines 40-60).

Koitabashi et al. also disclose the following claimed invention:

Referring to claims 2, 10, 25, 32: wherein said controller controls the position of printing the smaller dot by controlling the timing of printing the smaller dot (column 27, line 24-41).

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Referring to claims 3, 11, 18, 26: wherein in said timing control, the timing of applying signal voltage to print said smaller dot is controlled (column 27, line 64-67).

Referring to claims 5, 13, 20, 27: wherein said controller controls the printing position of the smaller dot by changing the speed of ejection of an ink droplet forming said smaller dot (column 3, lines 4-6 and column 27, line 10-28).

Referring to claims 7, 15, 22, 29, 33: wherein said ink jet printer comprising an ink jet head ejecting said ink droplet, said ink jet head being moved at a prescribed speed in a prescribed direction, and said controller controls the printing position of said smaller dot based on the ejection speed of the ink droplet and said scanning speed (column 27, line 24-30).

Referring to claims 8, 16: further comprising determination means for determining a direction of the printing position of said smaller dot/smoothing dots, said controller controlling the printing position of said smaller dot/smoothing dots according to the determination (column 26, line 6-17).

Referring to claim 9: a controller for changing a distance between the centers of adjacent dots thereby to change the printing position of the dot based on the size of the dot in printing said plurality of kinds of dots (FIG. 43).

Referring to claims 17, 23: determining whether or not control of the printing position of a dot is necessary (FIG. 43) and controlling the timing of printing the dot if it is determined necessary (FIG. 46B).

Referring to claims 24, 30, 31: a smoother for smoothing the image by arranging the smoothing dots around edges of the image forming dots (FIG. 43), wherein, on each scanning line, a distance between a center of at least one of the smoothing dots and a center of one of the

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image forming dots adjacent to said one smoothing dot is shorter than a distance between the centers of adjacent image forming dots (FIG. 43).

2. Claims 6, 14, 21, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koitabashi et al. (US 6325492) in view of Nagoshi et al. (US 6106093), as applied to claim 1, 5, 9, 13, 17, 20, 24, and 27, and further in view of Saruta (US 5980015).

Koitabashi et al., as modified, disclose the claimed invention as discussed above and also teach that the invention is applicable for the ink jet having plurality of piezo elements (column 33, lines 30-34) and when the ejection amount is varied, the ejection speed for each ejection amount is significantly varied associating therewith (column 2, line 65 to column 3, line 3). However, Koitabashi et al. do not disclose wherein said speed of ejection of said ink droplet is changed by changing a change degree in signal voltage to print said dot.

Saruta discloses a printing head in a printing apparatus capable to eject ink droplets having different sizes from the same nozzle (Abstract), wherein the ejection operation is controlled by applying different signals having different voltages to the same ejecting actuator at different time to eject droplets having different amount of ink (FIG. 5-6).

Therefore, it would have been obvious for one having ordinary skill in the art at the time the invention was made to modify the printing process in the printing apparatus disclosed by Koitabashi et al., as modified, such that applying the driving signals having different voltages to the same ejecting actuator to eject ink droplets in different amount to vary the ejection speed as disclosed by Saruta. The motivation of doing so is to obtain a printed image with high picture quality and gradation and to achieve high speed printing operation taught by Saruta (Abstract).

Response to Arguments

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Applicant's arguments with respect to claims 1, 9, 17, 24, and 30 have been considered but are moot in view of the new ground(s) of rejection.


Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to LAM S NGUYEN whose telephone number is (571)272-2151. The examiner can normally be reached on 7:00AM - 3:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, STEPHEN D MEIER can be reached on (571)272-2149. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LN
June 15, 2004


HAI PHAM
PRIMARY EXAMINER